REMARKS

Claims 1 - 14 remain active in this application. The specification has been reviewed and editorial revisions made where seen to be appropriate and to include terminology from the title of the application at appropriate points in the specification text. Claims 1 and 8 have been amended to emphasize novel aspects of the invention. Support for the amendments of the claims is found throughout the application, particularly in Figure 3 and the description thereof on pages 12 - 15. No new matter has been introduced into the application.

Claims 1, 2, 4 - 8 and 10 - 14 have been rejected under 35 U.S.C. §102 as being anticipated by Brogardh et al. Claims 3 and 9 have been rejected under 35 U.S.C. §103 as being unpatentable over Brogardh et al. in view of Nelson et al. Claims 6 and 12 have been rejected under 35 U.S.C. §103 as being unpatentable over Brogardh et al. in view of Zuckerwar et al. These grounds of rejection are respectfully traversed.

Initially, it is noted that the rejection of claims 6 and 12 under 35 U.S.C. §102 is contradicted by the statement of the rejection of claims 35 U.S.C. §103 in which the Examiner admits that Brogardh et al. does not teach a diaphragm with a reflective surface for which Zuckerwar et al. is cited. Therefore the rejection under 35 U.S.C. §102 is clearly in error as a matter of record in regard to claims 6 and 12.

The invention is directed to one of two sources of instability in known fiber optic sensors in which the gap dimensions (by which the condition of interest is measured using interferometric techniques or the like as the gap dimension changes due to the condition of interest) are established by an element of amorphous material such as glass. When such a material is used to establish initial gap dimensions and the sensor is

subjected to stress or other harsh conditions for an extended period of time, the amorphous material will exhibit viscous flow, creep and/or volume consolidation, causing gap dimensions to under go persistent change and the measurement to correspondingly drift. The invention avoids this problem by using a crystalline material which, due to its crystalline form and corresponding maximum density, is resistant to viscous flow, creep or volume consolidation and thus is also resistant to drift even in an environment of persistent stress.

Brogardh et al. is directed to a very different type of fiber optic sensor which does not, in any way, exploit changes in dimensions of a gap due to the condition of interest. Rather, Brogardh et al. uses at least one luminescent material which, when illuminated with light of one wavelength, luminesces for a short period of time at another wavelength and the measurement is made based on the decay time of the luminescence or the relative magnitude of luminescence as illumination is varied in response to the condition of interest. A reflective surface is used merely to avoid excess illumination or luminescent light loss and not to provide a gap by means of which a measurement is made.

This very basic difference from the invention may be appreciated from the fact that the embodiment of Figure 1 does not include a gap and that the gap in other embodiments merely allows a relative shift of locations of luminescent material (e.g. in the embodiments of Figures 2 - 4) to alter relative illumination or interposition of a movable body 25 (Figure 5) or polarizer 28, 29 (Figure 6) for much the same purpose. Not only is the gap length irrelevant to the measurement made by Brogardh et al. but *amorphous and crystalline materials are considered to be equivalent for use therein* since both amorphous and

crystalline materials are free from internal partially reflective boundaries which would reduce light transmission. It should also be appreciated in this regard that the only embodiment in Brogardh et al. in which the reflective surface is supported by crystalline material has no gap at all and the embodiments which include a gap, however incidentally, do not have a reflective surface supported by crystalline material. For example, in Figure 3 (on which the Examiner relies), there is no location in which a reflector could be placed to form a gap consistent with layers 20, 21 performing their intended wave conduction function (see, for example, column 3, line 66) even if those layers are crystalline.

Therefore, it is abundantly evident that Brogardh et al. does not anticipate any claim in the application since Brogardh et al. does not teach (or suggest) the use of a crystalline material *bonded* to an optical fiber to *support a reflective surface* in a manner which forms a *gap* between the reflective surface and the end of the optical fiber as recited in all claims in the application. The Examiner's statement of the rejection under 35 U.S.C. §102 is silent in regard to the recited gap being established by crystalline material and therefore the Examiner has failed to make a *prima facie* demonstration of anticipation of any claim. In this regard, it should be noted that there is no bonding to the optical fiber noted in the description of Figure 3 of Brogardh et al. and, more importantly, there appears to be no reflective surface in the embodiment of Figure 3 of Brogardh et al., much less forming an end of the recited gap. Further, any proposed modification of Brogardh et al. seeking to answer such claim recitations under 35 U.S.C. §103 would be improper under the precedent of In re Gordon, 221 USPQ 1125 (Fed. Circ., 1984) since operation of Brogardh et al. as intended would be necessarily precluded thereby.

Likewise, Nelson is directed to an optical sensor employing much different principles of operation from either Brogardh et al. or the present invention. In Nelson, a large difference in CTE is developed between a gold film and a substrate in order to develop large stresses to alter a refractive index of a material placed between two optical elements and thus control light transfer between them. There is no teaching or suggestion of any particular relationship of coefficients of thermal expansion between a crystalline material and the fiber optic element and Nelson clearly teaches away from matching of CTEs of any elements as recited in claim 9 (and claim 2) and while the difference in CTEs of the metal film and the substrate is disclosed to be large, there is no teaching of maximizing the difference in CTEs much less of doing so between the optical fiber and the crystalline material, as recited in claim 3 (and 10) particularly to maximize change of gap dimensions with temperature.

Therefore, it is respectfully submitted that Nelson clearly does not mitigate the deficiencies of Brogardh et al. to answer the claimed subject matter and is not properly combinable therewith in view of the differences in principles of operation (which at least do not provide motivation for any modification of Brogardh et al to achieve the effect of the recited features in the context of the claimed invention as well a being non-analogous) if, in fact, Brogardh et al. can be properly modified at all to answer the recitations of the claims, as discussed above. Rather, it appears that Nelson is cited in an attempt to form a hindsight reconstruction of the invention which still fails to answer the recitations of the claims.

In a like manner, it is respectfully submitted that Zuckerwar et al. is not properly combinable with Brogardh et al. since it is even more clearly non-analogous to Brogardh et al. and even more clearly

preclude operation of Brogardh et al in the intended manner if Brogardh et al. were to be modified in accordance with any feature thereof. Further the lack of motivation for use of any material of any increased dimensional stability for any element is not provided by either Brogardh et al. or Zuckerwar et al. since dimensional stability is of no apparent importance in either device, particularly in Zuckerwar et al. where the condition of interest is vibration of the atmosphere and no persistent stress is applied. Moreover, Zuckerwar et al. teaches away from seeking dimensional stability insofar as it preferably provides for stretching the membrane to regulate high frequency response. See column 7, line 39 to column 8, line 39. Thus Zuckerwar et al. does not mitigate the deficiencies of Brogardh et al. discussed above and certainly does not teach or suggest the recitations of claim 6, and does not teach or suggest how a diaphragm as recited in claims 5 and 12 could be applied to Brogardh et al. consistent with the principles thereof.

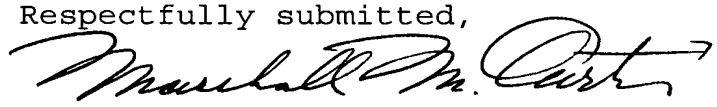
Accordingly, it is respectfully submitted that all of the grounds of rejection asserted by the Examiner are clearly in error. the teachings of the references cannot be combined or otherwise modified consistent with the intended manner of operation of the devices disclosed in the references relied on and are clearly non-analogous to each other and to the invention as well. The references taken singly or in any combination do not even recognize the problem for which a solution is provided by the invention much less lead to an expectation of success in doing so and thus do not provide evidence of a level of ordinary skill in the art which would support a conclusion of obviousness of any claim and, certainly, no claim is anticipated by any applied reference, particularly as now amended to emphasize the novel features and effects of the invention. The Examiner has not made a *prima facie*

demonstration of anticipation or obviousness of any claim in the application and, it is respectfully submitted that such a demonstration cannot be made based on the applied references particularly in view of the amendments made above. Therefore, reconsideration and withdrawal of the grounds of rejection of record are respectfully requested.

Since all rejections, objections and requirements contained in the outstanding official action have been fully answered and shown to be in error and/or inapplicable to the present claims, it is respectfully submitted that reconsideration is now in order under the provisions of 37 C.F.R. §1.111(b) and such reconsideration is respectfully requested. Upon reconsideration, it is also respectfully submitted that this application is in condition for allowance and such action is therefore respectfully requested.

If an extension of time is required for this response to be considered as being timely filed, a conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



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